

REMARKS

The Office Action dated April 7, 2004 has been received and carefully noted. The following remarks are submitted as a full and complete response thereto. Claims 27-51 are currently pending in the application and are respectfully submitted for consideration.

Claims 27-38 and 43-51 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dennison (U.S. Patent No. 5,546,445) in view of Kim (U.S. Patent No. 6,208,631). The Office Action took the position that Dennison discloses all of the elements of the claimed invention, with the exception of “deciding on the basis of the result of said processing of said location information, whether a first handover condition based on said location information is fulfilled or not, wherein said first handover condition is based on said location information and indicates that a handover is necessary for establishing or maintaining the communication between the mobile station and the communication network, when the first handover condition is not fulfilled, checking subscriber specifications, whether or not another measurement, which is related to a handover and is not based on said location information, is to be performed, wherein said another measurement results in a determination of a second handover condition indicating that a handover is necessary for establishing or maintaining the communication between the mobile station and the communication network.” Kim was cited as curing the deficiencies in Dennison, and the Office Action took the position that it would have been obvious to a person of ordinary skill in the art to combine Dennison and Kim to

yield the claimed invention. Applicants respectfully submit that the presently pending claims recite subject matter which is neither disclosed nor suggested in the cited prior art.

Claim 27, upon which claims 28-42 are dependent, recites a method for performing a handover procedure for a mobile station communicating in a communication network and being movable therein. The communication network comprises a plurality of base transceiver stations being adapted to perform a communication with the mobile station within a coverage area of a respective one of the base transceiver stations. The method comprises a processing step, a deciding step, a designating step, a triggering step and a performing step. The processing step processes location information related to the mobile station by comparing position information of the mobile station with position information related to the base transceiver stations. The deciding step decides on the basis of the results of the processing of the location information, whether a first handover condition based on location information is fulfilled or not. The first handover condition is based on the location information and indicates that a handover is necessary for establishing or maintaining the communication between the mobile station and the communication network. When the first handover condition is not fulfilled, the deciding step also checks subscriber specifications to decide whether or not another measurement, which is related to a handover and is not based on the location information, is to be performed, wherein another measurement results in a determination of a second handover condition. The second handover condition indicates that a handover is necessary for establishing or maintaining the communication between the

mobile station and the communication network. The designating step designates a next base transceiver station in the communication network, to which the communication with the mobile station is to be directed from a current base transceiver station, when the first handover or the second handover condition is fulfilled. The triggering step triggers a handover of the communication connection of the mobile station from the current base transceiver to the next base transceiver station designated in the designation step. The performing step performs the handover.

Independent claim 43, upon which claims 44-51 are dependent, contains some elements which are similar to elements in claim 27, but is directed to a device for controlling a handover procedure for a mobile station communication in a communication network and being movable therein.

As discussed in the present specification, a method and device for performing handovers using location information is provided. In one embodiment, the invention employs location information which is, for example, periodically determined to decide whether a handover is to be performed and to which base transceiver station the communication is to be changed. One advantage of the present invention is that the base transceiver stations can be intermittently turned off when their services are not needed. Specifically, a base transceiver station may be turned on by a corresponding base station controller only when a mobile station enters the base transceiver station's coverage area. This is a cost saving feature of an embodiment of the invention, and it also reduces power consumption.

It is respectfully submitted that the prior art of Dennison and Kim, when viewed singly or when combined, fail to disclose or suggest all of the elements of the presently pending claims. Therefore, the prior art fails to provide the critical and unobvious advantages discussed above.

Dennison discloses a cellular telephone system, including a plurality of cell sites and a mobile telecommunications switching office, which uses the position of a mobile unit to make call management decisions. The exact location of each mobile unit is determined using a Global Positioning System (GPS), LORAN, or other position determining system. The exact longitude and latitude of the mobile unit is then communicated to the mobile telecommunications switching office (MTSO), and the cell site that services that particular position is signaled by the MTSO to carry the call associated with the mobile unit. The position of the mobile unit is constantly updated, and call management decisions, such as handoffs, can be made based on the location of the mobile unit rather than the strength of signal associated with that unit.

Kim discloses an intra-cell inter-frequency hard handoff method in a CDMA cellular system. The method includes the steps of setting up a new call, confirming whether a current base station satisfies a condition of inter-frequency hard handoff and whether a currently used frequency in the base station satisfies a condition of inter-frequency hard handoff. If both conditions are satisfied, the method will check whether the output signal strength of the base station is less than the output signal strength threshold value, and command a hard handoff when the base station output signal

strength is less than the output signal strength threshold value. Additionally, Kim commands a hard handoff when the base station-to-mobile station distance is greater than the distance threshold value.

Applicants respectfully submit that Kim fails to cure the deficiencies in Dennison which were acknowledged in the Office Action. Specifically, the combination of Dennison and Kim does not disclose or suggest “deciding on the basis of the result of said processing of said location information, whether a first handover condition based on said location information is fulfilled or not, wherein said first handover condition is based on said location information and indicates that a handover is necessary for establishing or maintaining the communication between the mobile station and the communication network,” as recited in the independent claims.

Kim, on the other hand, is only directed to an inter-frequency handoff within a single base station. According to the disclosure of Kim, and as discussed above, “the base station monitors the reported output signal strength and always monitors the distance. The base station continuously estimates the distance between the base station and the mobile station (s160). When the output signal strength is less than the set threshold value on output signal strength (s170) or when the distance is more than the set threshold value on distance (s180), the base station commands the mobile station to perform a hard handoff to the frequency F1 (s190). After performing the hard handoff to the frequency F1 as commanded by the base station, the mobile station recognizes a

neighboring base station, because the neighboring station uses the frequency F1” (Kim, Column 4, line 62 – Column 5, line 6).

As a result, the handoff decision described in Kim does not lead directly to a handover to another base station; rather it is directed to a handoff between frequencies. Furthermore, the combination of Dennison and Kim fails to disclose or suggest first and second handover conditions, respectively, which specifically indicate that a handover is necessary for establishing or maintaining the communication between the mobile station and the communication network.

In addition, the combination of Dennison and Kim fails to teach or suggest “designating a next base transceiver station in said communication network, to which the communications with said mobile station is to be directed from a current base transceiver station, when the first handover or the second handover condition is fulfilled.” Dennison only discloses that the mobile telecommunications switching office selects the cell site most appropriate for the mobile unit and hands that mobile unit off to that cell site (Dennison, Column 5, lines 41-43). Kim, like Dennison, also fails to disclose which base station should be designated as the next base station to which communication with the mobile station is to be directed. Moreover, neither Dennison nor Kim discloses making such a designation based on the fulfillment of a first or second handover condition.

Claims 28-38 and 44-51 are dependent upon claims 27 and 43, respectively. Therefore, claims 28-38 and 44-51 should be found allowable for at least their dependence upon claims 27 and 43, and for the specific limitations recited therein.

Claims 39-42 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dennison and Kim in view of Menich (WO 93/19560). The Office Action took the position that Dennison and Kim fail to teach that the coverage area of the base transceiver station designated in said designating step and to which the communication connection is to be directed as a coverage area not adjacent to the coverage area of the current base transceiver station.

Applicants note that claims 39-42 are dependent upon claim 27. Menich fails to cure the deficiencies in Dennison and Kim discussed above with respect to claim 27. Thus, the combination of Dennison, Kim and Menich fails to disclose or suggest all of the elements of claims 39-42.

Applicants respectfully submit that Dennison, Kim and Menich, whether viewed alone or in combination, fail to disclose or suggest critical and important elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 27-51 be allowed and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosures: Petition for Extension of Time